

REMARKS

Claims 1-27 are currently pending in this application. This Reply adds claims 26 and 27. Applicant respectfully submits that these amendments introduce no new matter into the application.

Claim Rejections - 35 USC § 112

The Action rejected claims 1-20 under 35 USC § 112, as failing to comply with the written description requirement, asserting that the limitation “wherein no conditioning solutions are added to the soil during performance of the method” was not described in the specification. As recognized by the Action, paragraph [0027] of the specification recites that Applicant’s method “does not involve the use of potentially toxic conditioning solutions.” Applicant respectfully submits that this language fully supports the claim limitations, as a person of ordinary skill in the art would recognize it as generally encompassing conditioning solutions, which are all “*potentially toxic*,” and phrased in this manner in order to highlight that the omission of conditioning solutions is an advantage of the invention.

Accordingly, withdrawal of the claim rejections under 35 USC § 112 is respectfully requested.

Claim Rejections - 35 USC § 103

The Action rejected claims 1-25 under 35 USC § 103(a) as obvious over Shapiro (US 6,521,810) in view of Ho (US 5,476,992). Applicant respectfully traverses this rejection.

The Action cites Shapiro as teaching each of the steps of Applicant's claimed method, except for the generation of an abrupt pH and Eh gradient. Contrary to the Action's assertions, Shapiro fails to teach or suggest a method "wherein no conditioning solutions are added to the soil during performance of the method" as recited in claim 1. Shapiro teaches adding remediating ions to the contaminated media to react with contaminants and produce reducing agents. See col. 4, line 56- col. 5, line 39. Ho fails to remedy Shapiro's deficiencies, teaching a step of "introducing material for treating contaminants in the contaminated heterogeneous soil region selected from the group consisting of microorganisms, nutrients, electron acceptors, catalysts, absorbents, surfactants, electron donors, co-metabolites, chelating agents, ion exchange resins, buffers, salts and combinations thereof..." Col. 4, lines 56-61.

Independent claims 1 and 21 both recite "generat[ing] an abrupt pH and Eh gradient from acid to alkaline conditions." The Action cites Ho as teaching this step, stating that Ho "is cited to show that the application of an electric field to electrodes within soil would inherently cause the 'abrupt pH and Eh gradient' as

claimed (see col. 3 lines 13-31, in particular lines 21-26.” Action at page 3. The Action ignores that this portion of Ho’s disclosure deals with the limitations of electromigration, and in particular, explains that the generation of such a pH and Eh gradient is disadvantageous. As explained at col. 3, lines 19-31:

Electromigration has several limitations as currently practiced that make it impractical for actual field remediation. First, pH of the solution near the cathode tends to be very alkaline due to water electrolysis at the electrode and this causes most metals to precipitate in the soil making it difficult to remove the contaminants as well as blocking the flow of water through the contaminated soil region. Second, electrokinetics is inherently not a very stable process due to build-up of concentration, pH and osmotic gradients in the soil between the electrodes which adversely affect the process. In addition, the soil itself will also be altered over time, e.g. the soil will suffer from drying and cracking.

Underline emphasis added.

Ho therefore actually teaches away from Applicant’s claimed “abrupt pH and Eh gradient” and cannot be cited as teaching this limitation in making an obviousness rejection of the claims.

MPEP 2141.02 requires that in making an obviousness inquiry, an Examiner consider both the invention as claimed and the prior art references as a whole. With respect to the presently claimed invention, clear distinctions exist between it and the cited references. The state of the art, as evidenced by the cited references, indicates that a person of ordinary skill in the art would be deterred from

performing various steps of Applicant's claimed method, including generation of "an abrupt pH and Eh gradient...with the spontaneous in situ precipitation of a stable iron-rich band occurring at the boundary between the acid and alkaline zones." The formation of Applicant's iron-rich band creates both a physical and chemical barrier that can remain in place for continued groundwater protection, or excavated as a coherent mass. In contrast, Ho teaches that the formation of such a band has the disadvantages of "making it difficult to remove the contaminants as well as blocking the flow of water through the contaminated soil region." Col. 3, lines 24-26.

None of the cited references teaches every limitation of Applicant's claims, and the combination cited in the Action is improper because rather than teaching any of the steps or limitations as advantageous and thus combinable with other references to produce Applicant's claimed invention, the references teach away from them. This not only fails to support a finding of the claims as obvious, but supports their patentability over the prior art.

The remaining dependent claims should be patentable for at least the reasons discussed above.

Accordingly, withdrawal of the claim rejections under 35 USC § 103 is respectfully requested.

New Claims

New claim 26 includes various limitations not taught or suggested by the cited references. As discussed above, neither of the references teaches or suggests “generating an abrupt pH and Eh gradient from an acid zone...to an alkaline zone...[and] precipitating a stable iron-rich band at a boundary between the acid zone and the alkaline zone” and Ho actually teaches away from these limitations. The references further fail to teach or suggest precipitating such a band “to form a barrier to contaminants in the soil, sediment, or slurry.” With respect to claim 27, which depends from claim 26, the cited references further fail to teach or suggest “excavating the iron rich band.”

Conclusion

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephone interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

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In view of the foregoing amendment and remarks, Applicants respectfully submit that the present application is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

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